



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, DC 20230  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,223	11/26/2001	Kemchi Kurisu	50395-125	6863

7590 02/13/2003  
McDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 02/13/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Application No.

Applicant(s)

09/993 223

KURISU, KENICHI

## Office Action Summary

Examiner

Art Unit

Lan Vinh

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory maximum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely fee 1, may reduce any earned patent term adjustment. (See 37 CFR 1.704(b).)

## Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. (See 37 CFR 1.85(a).)
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of.
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/993223.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
3. ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3
4. ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 4, 5, 6 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and/or, cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). For the purpose of examination claims 4, 5, 6, the claim language of "an etching method for a ZnSe polycrystalline substrate as set forth in claims 1 through 3" is best understood by the examiner as "an etching method for a ZnSe polycrystalline substrate as set forth in one of claims 1 through 3"

2. For the purpose of examination, the term "chlorine-based gas which does not include a hydrocarbon group" is defined as  $\text{BCl}_3$  gas in page 4 of the specification.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States

4. Claims 1, 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Schetzina (US 5,351,255 )

Schetzina discloses a method for fabricating an integrated heterostructure semiconductor device comprises the step of reactive ion etching (RIE) zinc selenide

Art Unit: 1765

(ZnSe) substrate 15 using boron trichloride ( $\text{BCl}_3$ ) (col 19, lines 30-34 ), which reads on performing an etching method for a ZnSe polycrystalline substrate wherein reactive ion etching is applied by means of only chlorine-based gas which does not include a hydrocarbon group.

The limitation of claim 4 has been discussed above.

5. Claim 2 is rejected under 35 U.S.C. 102(b) as being anticipated by Narui et al (US 5,475,237 )

Narui discloses a method for forming a light emitting device comprises the step of etching a ZnSe layer 10 by RIE method using a mixed gas of boron trichloride ( $\text{BCl}_3$ ) and He/helium ( a known inert gas) (col 5, lines 55-56; col 6, lines 26-28), which reads on performing an etching method for a ZnSe polycrystalline substrate wherein reactive ion etching is applied by chlorine-based gas which does not include a hydrocarbon group and inert gas

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narui et al (US 5,475,237) in view of Collins (US 5,707,486)

Art Unit: 1765

Narui's method has been described above in paragraph 5. Naui differs from the instant claimed invention as per claim 3 by using an inert gas of helium instead of argon.

However, Collins, in a process of plasma etching/RIE etching, teaches that an inert gas such as argon and helium can be added to the etching gas chemistry (col 18, lines 9-11)

Since Naui is concerned with a step of RIE etching, one skilled in the art would have found it obvious to substitute Naui's inert gas of helium with argon in view of Naui's teaching because both gases are known inert gases and Naui states that argon is the preferred inert gas additive, because it is relatively massive and thus contributes to the sputter etch component of the RIE process (col 17, lines 32-35)

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schetzina (US 5,351,255 ) in view of Harafuji (US 5,635,021)

Schetzina's method has been described above in paragraph 4. Unlike the instant claimed invention as per claim 5, Schetzina does not specifically disclose performing the RIE etching at a gas pressure of 0.5 Pa through 1 Pa.

However, Harafuji, in a method of dry etching using RIE, teaches setting the gas pressure of a chlorine-based gas such as  $\text{BCl}_3$  at a pressure of 0.1-20 Pa (overlaps the claimed range of 0.5-1 Pa) during RIE etching (col 38, lines 55-61)

Since both Schetzina and Harafuji are concerned with RIE etching step using chlorine-based gas, one skilled in the art would have found it obvious perform

Art Unit 1765

Schetzina's RIE etching step at a pressure range as taught by Harafuji especially since Harafuji states that when other plasma internal parameters than the gas pressure are constant, the spread of the ion angular distribution can be controlled to a certain degree by changing the gas pressure of about 1 Pa (col 20, lines 64-67)

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schetzina (US 5,351,255 ) in view of Kim et al (US 6,037,267)

Schetzina's method has been described above in paragraph 4. Unlike the instant claimed invention as per claim 6, Schetzina does not specifically disclose activating the gas by means of radio frequency (RF)

However, Kim discloses a method of etching using RIE etching comprises the step of supplying RF (radio frequency) coil power to the upper electrode to excite the species of the gas (col 4, lines 38-41), which reads on activating the gas by means of radio frequency (RF)

Since Schetzina is concerned with RIE etching step, one skilled in the art would have found it obvious to modify Schetzina's RIE etching step by activating the gas by means of radio frequency (RF) as per Kim because according to Kim the coil RF power also constrains the electron to orbit in a plasma region away from the chuck, the electrons of the plasma then interact with other species of the etching gas to form ions and radicals (col 4, lines 42-45)

Art Unit: 1765

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 703 305-6302. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on 703 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and 703 872-9311 for After Final communications

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0661.



LV

February 6, 2003